Claims

1. A method of classifying an occupant of a motor vehicle seat, comprising the steps of:

measuring and sampling a seated weight of the occupant to form a primary data set including an average weight, an average standard deviation of said average weight and an average longitudinal center-of-mass of the occupant;

monitoring said average standard deviation of said primary data set to detect an initial period of weight measurement stability;

classifying the occupant as a forward-facing child seat if: (1) said initial period of weight measurement stability is detected, and (2) the average weight during said initial period does not exceed a child seat threshold, and (3) the average longitudinal center-of-mass during said initial period is rearward of a reference point; and

classifying the occupant as a rearward-facing child seat if: (1) said initial period of weight measurement stability is detected, and (2) the average weight during said initial period does not exceed a child seat threshold, and (3) the average longitudinal center-of-mass during said initial period is forward of said reference point.

2. The method of Claim 1, including the step of:

once the occupant is classified as a forward-facing child seat or a rearward-facing child seat, repeatedly measuring and sampling the seated weight of the occupant to detect child seat cinching based on a concurrent increase in average weight and rearward shifting of the average longitudinal center-of-mass.

3. The method of Claim 2, including the steps of:

repeatedly determining secondary measures of said average weight, said average standard deviation and said average longitudinal center-of-mass;

monitoring the secondary measures of average standard deviation to identify a transition from said initial period of weight measurement stability to a

period of weight measurement instability, followed by a transition from said period of weight measurement instability to said secondary period of weight measurement stability; and

10      detecting child seat cinching if (1) the average weight in said secondary period of weight measurement stability is greater than the average weight in said initial period of weight measurement stability and (2) the average longitudinal center-of-mass in said secondary period of weight measurement stability is rearward of the average longitudinal center-of-mass in said initial period of weight measurement stability.

4. The method of Claim 1, including the step of:

classifying the occupant as a generic child seat if (1) the average standard deviation is between first and second thresholds, and (2) the average weight does not exceed said child seat threshold by more than a reference

5      amount.

5. The method of Claim 4, including the step of:

once the occupant is classified as a generic child seat, repeatedly measuring and sampling the seated weight of the occupant to detect child seat cinching based on a concurrent increase in average weight and rearward shifting

5      of the average longitudinal center-of-mass.

6. The method of Claim 5, including the steps of:

repeatedly determining secondary measures of said average weight, said average standard deviation and said average longitudinal center-of-mass;

monitoring the secondary measures of average standard deviation to

5      detect a transition to a secondary period of weight measurement stability; and

detecting child seat cinching if (1) said secondary measure of average weight is greater than the average weight of said primary data set, and (2) the secondary measure of average longitudinal center-of-mass is rearward of the average longitudinal center-of-mass of said primary data set.

7. The method of Claim 1, including the step of:

classifying the occupant as an adult if said average weight exceeds an adult weight threshold and said average standard deviation exceeds an adult standard deviation threshold.

8. The method of Claim 1, including the step of:

classifying the occupant as an adult if said initial period of weight measurement stability is detected and the average weight exceeds an adult weight threshold.